

REMARKS

Claims 1-5 were pending in the application. Claims 1-5 have been amended. Upon entry of these amendments, Claims 1-5 will be pending and under active consideration. Claims 1-3 are independent.

Applicant submits respectfully that the amendments presented herein are supported fully by the claims and/or specification as originally filed and, thus, do not represent new subject matter.

Claims 1-5 have been amended extensively to point out more particularly and claim more distinctly that which Applicant regards as his invention. The claims have been reformatted and corrected grammatically, and excess verbiage has been removed. The term "expression" is now used to mean any work, phrase, or other expression. Support for this usage is found, for example, in the paragraph bridging pages 4-5, wherein it is noted that both the word "konnichiwa (hello)" and the phrase or sentence "ii tenki desu (it is a good weather)" are both "expressions." Support for terming the functionality that compares and recognizes expressions "operating means" is found, for example, at page 14, last 4 lines, and page 15, lines 2-6. The term "consecutively" is used in place of "continuous" for improved clarity.

Applicant acknowledges with thanks Examiner's withdrawal of the prior objections to the claims and specification, as noted at section 1 of the Final Office Action.

Applicant respectfully requests entry of the amendments and remarks made herein into the file history of the present invention. Reconsideration and withdrawal of the rejections set forth in the above-identified Final Office Action are respectfully requested.

The Rejections Under 35 U.S.C. § 103(a) Should Be Withdrawn

The Final Office Action, at sections 3-4, rejects Claims 1-5 as allegedly being obvious over U.S. Patent No. 4,761,815 to Hitchcock (hereinafter, "Hitchcock") in view of U.S. Patent No. 6,471,420 to Maekawa *et al.* (hereinafter, "Maekawa"), under 35 U.S.C. § 103(a) for the reasons of record. In short, the Final Office Action alleges that Hitchcock teaches all the limitations of the rejected claims, in particular that Hitchcock teaches the analysis of durational states of speech segments and compares the time lengths to pre-computed values stored in memory, with the exception that Hitchcock fails to teach the output means for outputting the result of voice recognition. The Final Office Action alleges that Maekawa cures this deficiency. Applicant traverses respectfully.

Applicant submits respectfully that the novel voice recognition devices of the present invention are neither taught nor suggested by Hitchcock, alone or in combination with Maekawa. There is neither teaching nor suggestion in these references that analysis of the duration (measured length of time) of entire expressions (*i.e.*, words, phrases, or sentences) may be used for voice recognition. In particular, there is no teaching in Hitchcock of using pauses *between* words in an expression as part of a voice recognition analysis.

Hitchcock teaches voice recognition of words accomplished by analyzing the frequency of the spoken input in 10 millisecond intervals to identify “word states,” which correspond to vowel-like, fricative-like, or silent word portions (see Hitchcock, Summary of the Invention, the paragraph bridging columns 24-25, and column 25, lines 35-53, for example). Consecutive 10 millisecond time intervals are summed when the measured frequencies cross certain thresholds, and a duration of a word state is recorded. Various word states are identified in a spoken word, and the pattern of the word states is compared to template patterns to match the spoken word with words that may be recognized from the computer memory. In other words, each word the computer is capable of recognizing is stored as a pattern of individual word states, and it is this pattern that is used to determine a match with the pattern of word states in a spoken word.

Accordingly, while the duration of individual *word states* is used as part of the voice recognition analysis as taught by Hitchcock, and while the Examiner is correct that the sum of the durations of the word states measured in the method of Hitchcock will equal the total length of time of a spoken word, Hitchcock neither teaches nor suggests that such a summation would ever be useful in speech recognition. Indeed, Hitchcock effectively *teaches away* from measuring the total duration of an expression by focusing narrowly on the use of time intervals to analyze portions of words (word states). In no instance does Hitchcock teach or suggest that summing the durations of the various word states would have utility; it is only the *pattern* of word states that is important. Spoken words to be analyzed are broken down into their component word states, and

the template words are stored as patterns of word states and individual word state durations, not as complete words with total word durations.

In Hitchcock, the duration of individual spoken word states is made a point of comparison to the expected duration of word states in a template, but it is only the difference in duration between individual word states that is considered useful (see column 15, line 54, to column 16, line 22, for example). It is useful as a measure of accuracy for identification of the *word state*. It may be argued that Hitchcock teaches that these word state-duration differences are tallied and employed in the final identification of complete words, and that this tally of the length differences is effectively equivalent to comparing the lengths of complete expressions as claimed presently. However, Hitchcock teaches tallying the *absolute values* of the differences between spoken and template word state durations (see column 15, line 55, and column 16, line 1).

Take, for example, a word having two word states, wherein one spoken word state is 50 milliseconds longer than the expected template word state time length and the second spoken word state is 50 milliseconds shorter than the expected template word state time length. Whereas the total word length according to the presently claimed invention would match the pre-measured value stored in storage, under the method of Hitchcock the two words would be considered to have a substantial 100 millisecond difference. Accordingly, Applicant submits respectfully that Hitchcock uses the measurement of time in a fundamentally different way than the devices and methods of the present invention. Again, Hitchcock effectively teaches away from the use of total word time length as used in the presently claimed invention. Of course, it is

axiomatic in the patent law that a reference that teaches away from an aspect of a claimed invention cannot be applied as a reference against that aspect of the claimed invention.

Furthermore, Applicant submits respectfully that Hitchcock does not teach the utility of measuring the total duration of a pause or pauses between words in an expression. The Examiner, at page 3, lines 10-13, of the Final Office Action, points to the "LIGHTS__OFF" example to show the manner in which Hitchcock employs the duration of silent periods, which the Examiner appears to equate with pauses. Applicant submits respectfully that the cited example shows, in fact, that Hitchcock *does not* measure the duration of a pause between words.

Hitchcock's Table 4 describes a template matrix for recognizing a set of words. It should be noted, in preface, that Hitchcock defines "lights off" as being a single word (see column 20, lines 6-7). Lines 4 and 5 of Table 4 indicate the word state template for "lights" and "lights off." As the first digit indicates merely the number of word states in the template, it may be ignored for this analysis. The remaining digits for "lights" are 1, 0, 2, which are code for vowel-like (1), silent (0), and fricative-like (2) states, respectively. The "lights off" code is 1, 0, 2, 1, 2. The first three digits represent "lights" and the last two digits represent "off," having a first vowel-like state and a second fricative-like state. Thus, it is clear that Hitchcock is *not* measuring a pause between the words in the expression "lights off" as no reference silent state (0) is included in the code for a pause between "lights" and "off."

Applicant submits respectfully that the method of Hitchcock identifies continuous words, not expressions containing words and pauses between words. The recorded

silent states tallied by Hitchcock are silent states *within* words, not between them.

While Hitchcock does assess silent states having durations above 160 milliseconds to identify the ends of words (see column 13, lines 39-40), the total duration of that silent state between words is not recorded: only the fact that the duration exceeds 160 milliseconds is significant, not the total duration of the silent interval. In fact, the identification of such a 160+ millisecond interval *ends* the recording of data for analyzing a given word; the silent interval data, itself, is not used in the analysis. Accordingly, Applicant submits respectfully that Hitchcock does not teach, or even suggest, the use of duration measurements of pauses between words as claimed presently.

Furthermore, Applicant submits respectfully that Maekawa is not alleged to cure these deficiencies in Hitchcock. Accordingly, Applicant submits respectfully that as Maekawa fails to cure the deficiencies of Hitchcock with respect to the rejected claims of the present invention, the combination of the Hitchcock and Maekawa fails to meet the threshold required for establishing a *prima facie* case of obviousness under 35 U.S.C. § 103(a).

Accordingly, Applicant submits respectfully that the rejection of Claims 1-5 under 35 U.S.C. § 103(a) has been overcome, and Applicant requests respectfully that the rejection of Claims 1-5 under 35 U.S.C. § 103(a) be withdrawn.

CONCLUSION

Applicant submits respectfully that the present application is in condition for allowance. Favorable reconsideration, withdrawal of the rejections set forth in the above-noted Final Office Action, and an early Notice of Allowance are requested.

If the Examiner feels that an interview would facilitate the prosecution of this application, Applicant respectfully urges the Examiner to contact the undersigned directly at 202-295-8466.

In general, Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 424-7500. All correspondence should be directed to our address given below.

AUTHORIZATION

Applicants believe there is no fee due in connection with this filing. However, to the extent required, the Commissioner is hereby authorized to charge any fees due in connection with this filing to Deposit Account 19-5127 (Order No. 18920.0016) or credit any overpayment to same.

Respectfully submitted,



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Dated: September 28, 2004